Manufacturing R&D for the Hydrogen Economy Roadmap Workshop

In his 2003 State of the Union Address, President Bush announced a $1.2 billion Hydrogen Fuel Initiative to accelerate the development of the hydrogen and fuel cell technologies needed to move the U.S. toward a future hydrogen economy. While many scientific, technical, and institutional challenges must be overcome to realize the vision of the hydrogen energy economy, moving from today's laboratory-scale fabrication technologies to low-cost, high-volume commercial manufacturing has been identified as one potential showstopper to a future hydrogen economy.

The Federal Interagency Working Group on Manufacturing has, therefore, identified Manufacturing R&D for the Hydrogen Economy as a priority area to coordinate and leverage federal efforts aimed at low-cost, high-volume manufacturing processes; advanced manufacturing tools, manufacturing infrastructure, and measurements and standards. Participants in this working group include the Department of Energy (lead organization), Department of Agriculture, Department of Commerce, Department of Defense, Department of Transportation, Environmental Protection Agency, National Aeronautics and Space Administration, National Science Foundation, Office of Management and Budget, and the White House Office of Science and Technology Policy. Over the last year, this working group has been laying the foundation for developing a roadmap to guide and coordinate R&D efforts on manufacturing critical to commercializing hydrogen and fuel cell technologies. The *Roadmap Workshop on Manufacturing for the Hydrogen Economy* is the next step in this process.

The purpose of this workshop is to bring together key industry, university and government representatives to discuss the critical issues facing all aspects of manufacturing for hydrogen products: (1) hydrogen production and delivery systems, (2) hydrogen storage systems, and (3) fuel cells that convert hydrogen into electric energy. The workshop will outline the key technical problems facing the manufacture of hydrogen systems today and identify priorities for research and development of manufacturing processes needed for the transition to a hydrogen economy (2005-2025), The recommendations from this workshop will be incorporated into the *Roadmap on Manufacturing R&D for the Hydrogen Economy*. This roadmap will be used to guide R&D on critical manufacturing and technical standards required for low-cost, high-volume production, and to direct future public-private partnerships that will facilitate transfer of technology to industry through cost-shared projects.

DRAFT Agenda

Roadmap Workshop
on
Manufacturing R&D for the Hydrogen Economy

July 13-14, 2005
Washington, D.C.

Workshop Goal – Develop a roadmap for research & development of manufacturing processes for hydrogen technologies (by identifying and prioritizing R&D needs).

July 13, 2005

Plenary Session

08:30 Welcome & Introduction
08:45 Plenary Remarks
- President's Hydrogen Fuel Initiative – JoAnn Milliken, DOE
- President's Manufacturing Initiative – Dale Hall, DOC
- Charge to Workshop Participants – George Sverdrup, NREL

09:45 Move to Breakout Groups

Parallel Technical Sessions
Production & Delivery, Storage, Fuel Cells

10:00 Organize Each Breakout Group – Facilitators

10:10 Overview for Each Group
- Requirements for manufactured systems
- Status of manufacturing technologies

- Production: Rick Zalesky, ChevronTexaco Technology Ventures
- Storage: Andy Abele, Quantum Technologies
- Fuel Cells: Steve Mallinson, Ballard Power Systems

11:00 Identify Hydrogen Systems & Components to be Manufactured through 2025 - *Facilitated Session*

12:15 Lunch

1:15 Identify Needs and Limitations of Existing Manufacturing Technologies - *Facilitated Session*

3:00 Break

3:20 Identify Manufacturing Processes in This and Other Industries that Might be Applied to Hydrogen Systems - *Facilitated Session*

6:00 Dinner on your Own

July 14, 2005

Resume Parallel Technical Sessions
Production & Delivery, Storage, Fuel Cells

08:30 Prioritize Manufacturing Needs & Processes for Public/Private R&D - *Facilitated Session*

10:30 Break

10:50 Identify Cross-Cutting Capabilities & Possible Core Technologies that will be needed - *Facilitated Session*

12:00 Working Lunch by Breakout Group to Review Group Material for Concluding Plenary Session

Plenary Session

1:00 Summary Remarks by Group Speakers
- Production & Delivery
- Storage
- Fuel Cells

2:30 Intellectual Property Considerations
- Paul Gottlieb , DOE
- Representative from DOC

2:50 Options for Structuring Public/Private R&D Partnerships
- George Sverdrup, NREL
- David Stieren, DOC

3:20 Closing Remarks by DOE
- JoAnn Milliken, DOE

3:30 Adjourn